

CLAIMS

1. A monitoring device for monitoring vital signs, the monitoring device including a housing; signal input components positioned in the housing to receive an electrical signal carrying data representing at least one vital sign of a subject; and wireless communications circuitry mounted in the housing and connected to the input components for transmitting and receiving wireless signals.
- 10 2. A monitoring device as claimed in claim 1, in which processing circuitry is mounted in the housing, the processing circuitry being configured to process signals generated by the input components and to communicate processed signals to the wireless communications circuitry.
3. A monitoring device as claimed in claim 2, in which the signal input components include a number of plug sockets mounted on the housing to permit a number of plugs on electrical leads to be plugged into respective sockets, the processing circuitry being configured to process signals received from the leads for transmission by the wireless communications circuitry.
- 20 4. A monitoring device as claimed in claim 3, in which the housing includes a first cover member and a second cover member that are configured to be clipped together to enclose the processing circuitry and the communications circuitry, the cover members being shaped to accommodate the sockets.
5. A monitoring device as claimed in claim 2 or 3, in which the input components include a number of snap fasteners mounted on the housing and connected to the processing circuitry.

6. A monitoring device as claimed in 5, in which the snap fasteners are spaced to accommodate a number of electrocardiographic electrode studs fastened to a subject.

7. A monitoring device as claimed in claim 5 or 6, in which the housing includes a first cover member and a second cover member that are configured to be clipped together to enclose the processing circuitry and the communications circuitry, the snap fasteners being mounted in one of the cover members.

10 8. A monitoring device as claimed in claim 2 or 3, in which the input components include a number of metal electrodes mounted on the housing to be accessible from outside the housing and spaced sufficiently to detect an electrocardiographic signal when the electrodes are brought into contact with a subject.

9. A monitoring device as claimed in claim 5 or 6, in which the input components include a number of metal electrodes mounted on the housing to be accessible from outside the housing and spaced sufficiently to detect an electrocardiographic signal when the electrodes are brought into contact with a subject, the electrodes being mounted in one of the cover members.

20

10. A monitoring device as claimed in any one of claims 2 to 9, in which the processing circuitry includes a memory module to permit data representing the signals received by the input components to be stored.

11. A monitoring device as claimed in claim 10, in which the processing circuitry is configured to transmit data in the memory module via the communications circuitry.

30

12. A monitoring device as claimed in any one of claims 2 to 11, in which the processing circuitry is configured to carry out an analysis on the signals received by the input components to detect anomalies in the signals and to generate a signal for transmission by the communications circuitry on detection of said anomalies.

13. A monitoring device as claimed in claim 12, in which a discernible signal generating device is mounted on the housing and is connected to the processing circuitry, the processing circuitry being configured to generate a discernible signal for emission by the signal generating device on detection of an anomaly.
14. A monitoring device as claimed in any one of claims 2 to 13, in which a manually operated event switch is positioned on the housing and is connected to the processing circuitry to generate a signal for transmission by the wireless communications circuitry on operation by a user.
15. A monitoring device as claimed in any one of claims 2 to 14, in which a printed circuit board is mounted in the housing, the processing circuitry and the communications circuitry being mounted on the printed circuit board.
16. A monitoring device kit for monitoring vital signs, the monitoring device kit including
 - at least two housing members that are detachably connected to each other;
 - signal input components positioned on one of the housing members to receive an electrical signal carrying data representing at least one vital sign of a subject;
 - wireless communications circuitry mounted in the housing and connected to the input components for transmitting and receiving wireless signals; and
 - at least one further housing member that is interchangeable with one of said at least two housing members, further signal input components being positioned on said at least one further housing member.
17. A monitoring device kit as claimed in claim 16, in which the at least two housing members are a first cover member and a second cover member which can be detachably clipped together, the at least one further housing member being at least one further cover member.

18. A monitoring device kit as claimed in claim 17, which includes processing circuitry mounted on the first cover member and configured to process signals generated by the signal input components for transmission by the wireless communications circuitry.

19. A monitoring device kit as claimed in claim 18, in which the signal input components include a number of plug sockets that are connected to the processing circuitry, the first and second cover members being shaped to accommodate the plug sockets.

10

20. A monitoring device kit as claimed in claim 18, in which said at least one other cover member is a third cover member, the signal input components including a number of snap fasteners mounted on the third cover member and connected to the processing circuitry.

21. A monitoring device kit as claimed in claim 19, in which said at least one other cover member is a third cover member, the signal input components including a number of snap fasteners mounted on the third cover member and connected to the processing circuitry, the third cover member being shaped to cover the plug sockets.

20

22. A monitoring device kit as claimed in claim 18, in which said at least one other cover member is a fourth cover member, the signal components including a number of electrocardiographic electrodes mounted on the fourth cover member and connected to the processing circuitry.

23. A monitoring device kit as claimed in claim 19, in which said at least one other cover member is a fourth cover member, the signal components including a number of electrocardiographic electrodes mounted on the fourth cover member and connected to the processing circuitry, the fourth cover member being shaped to cover the plug sockets.

30

24. A monitoring device kit as claimed in any one of claims 20 to 23, wherein a printed circuit board is positioned on the first cover member and a number of spring-mounted contact members is positioned on the printed circuit board to bear against either the snap fasteners or the electrocardiographic electrodes, depending on whether the third or fourth cover member is attached to the first cover member, the processing circuitry and the communications circuitry being mounted on the printed circuit board.
25. A system for monitoring vital signs, the system including
10 a monitoring device as claimed in any one of claims 1 to 15; and a receiver for receiving a signal transmitted by the wireless communication circuitry of the monitoring device.
26. A system as claimed in claim 25, in which the receiver is a wireless modem.
27. A system as claimed in 26, which includes a personal computer that is connected to the wireless modem to receive data relating to the signal.
28. A system as claimed in claim 27, in which the personal computer is
20 programmed to carry out algorithmic processes on the data and to display the results of those processes.
29. A system as claimed in claim 27 or 28, in which the personal computer is connected to a monitoring centre and is configured to communicate data relating to the signal received from the monitoring device to the monitoring centre.
30. A system as claimed in claim 25, in which the receiver is an application-specific device.
- 30 31. A system as claimed in claim 25, in which the receiver is a conventional handheld wireless communications device which is configured to receive the signal

from the monitoring device and at least to display data relating to the signal to the user.

32. A system as claimed in claim 31, in which the communications device is configured to relay the signal to a monitoring centre, via a wireless communications protocol.

33. A method of monitoring vital signs, the method including the step of receiving data from a monitoring device as claimed in any one of claims 1 to 15.

10

34. A method as claimed in claim 33, which includes the step of communicating wirelessly with the subject.

35. A method as claimed in claim 34, which includes the step of transmitting a signal to a subject via the wireless communications circuitry of the monitoring device.

36. A method as claimed in any one of claims 33 to 35, which includes the step of applying analytical algorithms to the data received from the monitoring device.

20 37. A method as claimed in claim 33, insofar as claim 33 is dependent on claim 10, which includes the step of downloading data stored in the memory module of the monitoring device via a wireless communications protocol.

38. An accessory for a monitoring device as claimed in any one of claims 1 to 15, the accessory including

a support member;

a number of spaced contact pads positioned on the support member, each contact pad being of a conductive fabric; and

a number of connectors electrically connected to respective contact pads and

30 detachably connectable to the input components of the monitoring device.

39. An accessory as claimed in claim 38, in which the support member is a sheet of flexible material, the spaced contact pads being attached to the sheet so that a subject can place both hands on the sheet.

40. An accessory as claimed in claim 38, in which the support member is a chest strap, the spaced contact pads being positioned to bear against a subject's thoracic area when worn.

41. An accessory as claimed in claim 39 or 40, insofar as they are dependent on
10 claim 5, in which the connectors are studs to permit the monitoring device to be snap fastened to the support member.

42. An accessory as claimed in any one of claims 38 to 41, in which the conductive fabric is elasticised.

43. A method of monitoring blood composition, the method including the steps of:
receiving blood composition data from a sensor;
transmitting a signal carrying the blood composition data to a communications device;

20 relaying the signal from the communications device to a computer; and
decoding a signal with the computer.

44. A method as claimed in claim 43, which includes the step of transmitting data back to the communications device.

45. A method as claimed in claim 43, in which the step of transmitting the signal is carried out wirelessly.

46. A method of treating a patient with a blood related disease, the method
30 including the steps of:

remotely obtaining blood composition data from the patient at predetermined intervals;

storing the blood composition data in a database;
applying analytical algorithms to the blood composition data when the database is updated; and
sending event-driven signals to the patient based on results of the analytical algorithms.

47. An apparatus for monitoring blood composition, the apparatus including

10 a sensor for sensing blood composition, the sensor being configured to generate a signal carrying data representing the blood composition;
a first communications device connected to the sensor and configured to receive the signal from the sensor and to transmit the signal;
a second communications device that is configured to receive the signal from the first communications device and to transmit the signal; and
a computer that is configured to receive the signal from the second communications device.

48. An apparatus for monitoring blood composition, the apparatus including

20 a sensor for sensing blood composition and for generating a signal carrying data representing a blood composition value; and
a communications device that is connectable to the sensor for receiving the signal and for transmitting the signal.

49. An apparatus for monitoring blood glucose levels, the apparatus including

a glucometer configured to generate a signal carrying data representing the blood glucose level;
a first communications device connected to the glucometer and configured to receive the signal from the sensor and to transmit the signal;
30 a second communications device that is configured to receive the signal from the first communications device and to transmit the signal; and

a computer that is configured to receive the signal from the second communications device.

50. An apparatus for monitoring blood glucose levels, the apparatus including a glucometer configured to generate a signal carrying data representing a blood glucose level; and
a communications device that is connectable to the glucometer for receiving the signal and for transmitting the signal.

10 51. An apparatus for monitoring blood oxygen levels, the apparatus including a pulse oximeter configured to generate a signal carrying data representing the blood oxygen level;
a first communications device connected to the pulse oximeter and configured to receive the signal from the pulse oximeter and to transmit the signal;
a second communications device that is configured to receive the signal from the first communications device and to transmit the signal; and
a computer that is configured to receive the signal from the second communications device.

20 50. An apparatus for monitoring blood oxygen levels, the apparatus including a pulse oximeter configured to generate a signal carrying data representing a blood oxygen; and
a communications device that is connectable to the pulse oximeter for receiving the signal and for transmitting the signal.